

We claim:

1. A chemotherapeutic composition comprising a
oligonucleotide-camptothecin drug complex which incorporates sufficient
amounts of active lactone camptothecin drug to exert therapeutic activity when
administered to the body, wherein the camptothecin drug dissociates from the
5 oligonucleotide within the body, and exerts its therapeutic activities.

2. The chemical composition of claim 1, where the camptothecin
drug is selected from a group consisting of camptothecin; 10-
hydroxycamptothecin; topotecan; 9-aminocamptothecin; 9-nitrocamptothecin;
10-hydroxycamptothecin; 10,11-methylenedioxcamptothecin; 9-nitro-10,11-
5 methylenedioxy-camptothecin; 9-chloro-10,11-methylenedioxcamptothecin;
9-amino-10,11-methylenedioxcamptothecin; 7-ethyl-10-hydroxycamptothecin
(SN-38); DX-8951; GG211; 7-trimethylsilylmethylcamptothecin; and mixtures

thereof.

3. The composition of claim 1 where the oligonucleotide is selected from the group including single-stranded DNA, double-stranded DNA, antisense DNA, RNA, and catalytic RNA.

4. The composition of claim 1 where said camptothecin drug is noncovalently associated with the DNA and naturally dissociates in the body to release the active lactone form of the drug.

5. The composition of claim 1 where said camptothecin drug is covalently tethered to the oligonucleotide molecule and can be metabolically released from the oligonucleotide within the body.

6. The composition of claim 1 wherein said oligonucleotide-camptothecin drug complex is held within macromolecular assemblies of viral oligonucleotide vectors having a viral gene delivery system including retroviruses, adenoviruses, adeno-associated viruses, *Herpes* viruses, *Vaccinia* viruses, and other virus particles.

7. The composition of claim 1, wherein said oligonucleotide-camptothecin drug complex is held within macromolecular assemblies of non-viral oligonucleotide vectors having a non-viral gene delivery system including

transfection vehicles, naked DNA for injection, gene gun particles, liposomes
5 including cationic liposomes, virosomes, receptor-mediated delivery vehicles,
and biodegradable and non-biodegradable polymer matrixes.

8. The composition of claim 1 further including lipid so as to
form a lipid:oligonucleotide-camptothecin drug complex from a surfactant,
lipid or mixture thereof, said lipid defining a compartment wherein said
oligonucleotide-camptothecin drug complex exists and the camptothecin drug
5 is held and protected from hydrolysis and is thus stabilized.

9. A method for delivering oligonucleotide-stabilized lactone
forms of camptothecin drugs to a host comprising the steps of: providing an
oligonucleotide-camptothecin drug complex as a delivery vehicle wherein said
camptothecin drug contains at least one lactone ring, and said oligonucleotide
5 is capable of associating with said camptothecin drug so that at least some part
of the lactone ring is associated with said oligonucleotide and thereby
protected from hydrolysis; and administering the oligonucleotide-camptothecin
drug complex to the host.